

PATENT SPECIFICATION

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(72) Inventors WILLIAM M. BROWN
JOHN M. RUDDY and
ROBERT T. DUNN(54) TELEPHONE EXTENSION SYSTEM UTILIZING
POWER LINE CARRIER SIGNALS

(71) We, WILLIAM M. BROWN, 25
Murphy Road, Hudson, Massachusetts,
United States of America; JOHN M.
RUDDY, 42 Pantry Road, Sudbury, Massa-
chusetts, United States of America; and
ROBERT T. DUNN, 4 Cedar Ridge Drive,
Bedford, Massachusetts, United States of
America, all citizens of the United States of
America, do hereby declare the invention, for
which we pray that a Patent may be granted
to us, and the method by which it is to be
performed, to be particularly described in and
by the following statement:—

This invention relates to telephone extension
systems providing a portable or mobile
extension telephone which communicates over
AC power wires. More particularly, the present
invention provides apparatus for communicating
over AC power wires between an extension
telephone and a conventional telephone line.

According to the present invention, there
is provided, a power line telephone extension
system in a subscriber's premises wired with
AC power wires, comprising a subscriber's
telephone line entering the premises from a
conventional telephone system, the subscribers
line including a trip wire and ring wire, a
master station coupled to the trip and ring
wires and coupled to the power wires by a
reactive coupling circuit, and an extension
station coupled to an extension telephone and
coupled to the power wires, at least one of
the said stations being arranged to modulate
telephone signals on to a carrier and to couple
the modulated carrier into the power wires,
and at least the other of the stations being
arranged to detect and demodulate the modulated
carrier to reconstitute the telephone
signals.

The invention will be described in more
detail, by way of example, with reference to
the accompanying drawings, in which:—

Figure 1 is a pictorial representation of an
extension telephone system including two
extension telephones which communicate with
a conventional telephone line via available AC
power wires and a conventional on line tele-

phone which communicates with the same
telephone line;

Figure 2 is an electrical block diagram
showing the principal electrical circuits at
the master station between the telephone line
and the available AC power wires;

Figure 3 is an electrical block diagram
showing the principal electrical circuits at
one of the extension telephone stations which
couple the extension telephone to the AC
power wires for communication with the tele-
phone line and the on line telephone;

Figure 4 is a detailed electrical block diagram
of the master station transmit-receive
unit;

Figure 5 is a diagram showing the sequence
of cradle switch, transfer/hold and other signals
that initiate coupling of the system to
the subscriber's telephone line;

Figure 6 is a detailed electrical block diagram
of the extension station transmit-receive
unit; and

Figure 7 is a circuit diagram of a conventional
battery telephone transmission network
of the type used in many conventional telephone
handsets and which is for example, the
ITT type 75335-1 network, and is suitable
for use in the master station transmit-receive
unit.

The embodiment of the invention includes
one or more extension telephones, each equipped
with an extension transmit-receive unit
(extension TR unit) enabling the extension
phone to couple directly to the available AC
power wires, and a master transmit-receive
unit (master TR unit) at the master station
which connects directly to the available AC
power wires and also couples to the telephone
line on which there is a conventional on line
telephone. This system is illustrated pictorially
in Figure 1. The master TR unit serves as an
interface between the subscriber's line and the
available AC power wires. These power wires act
as a transmission medium for the signals on the
telephone line and carry these signals to the
extension telephone stations and also carry signals
from the extension telephone stations to the telephone